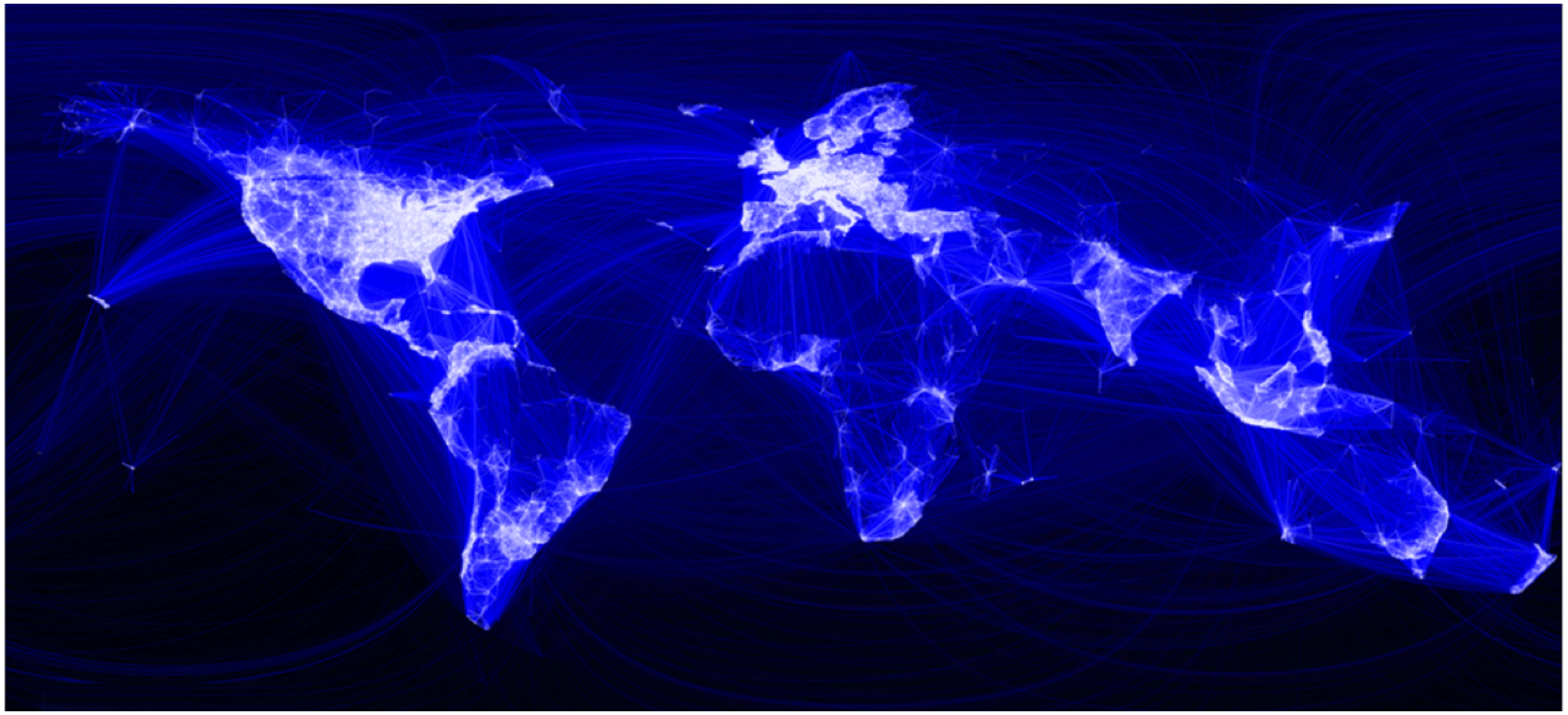
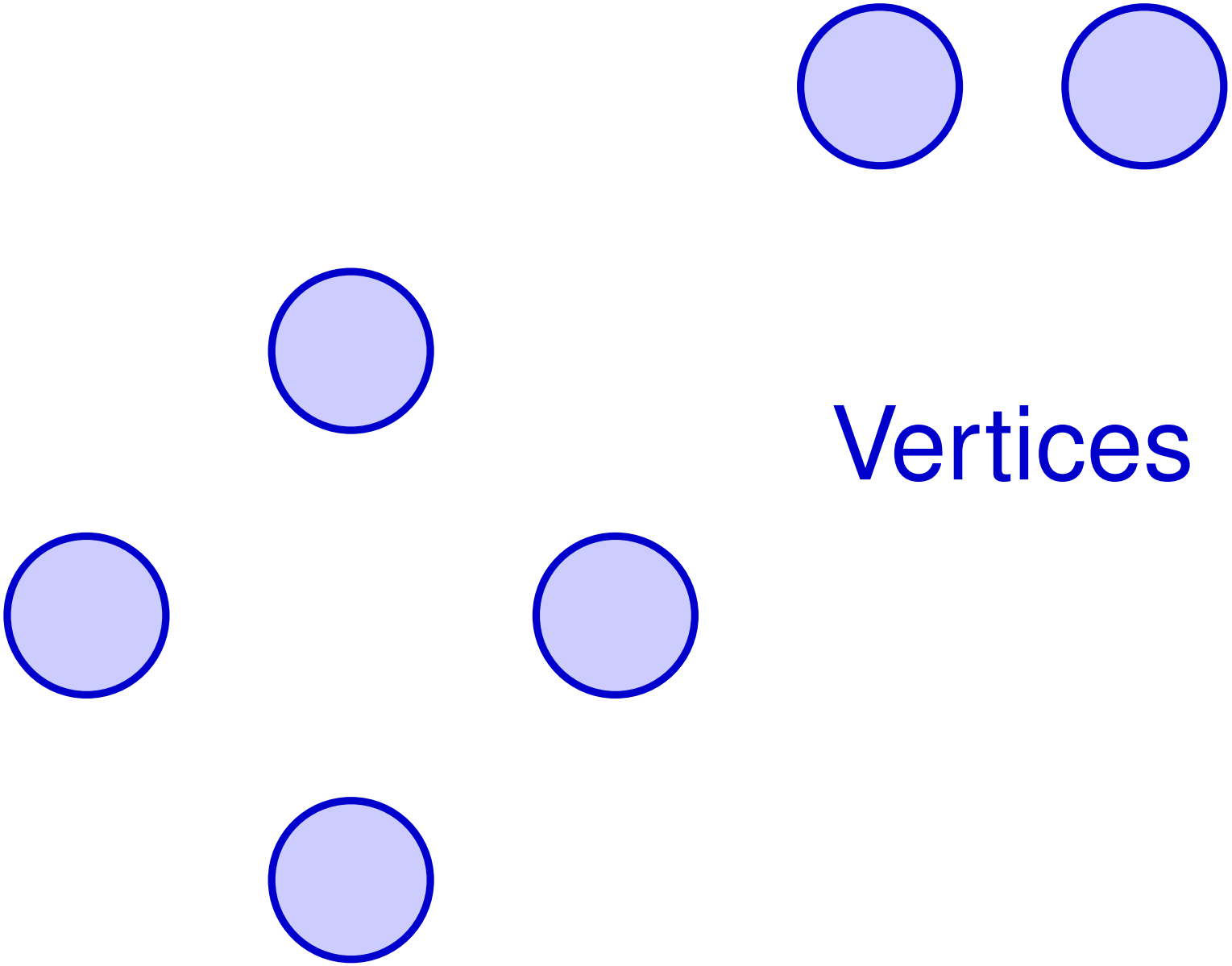
Sports Scheduling with Graph Theory

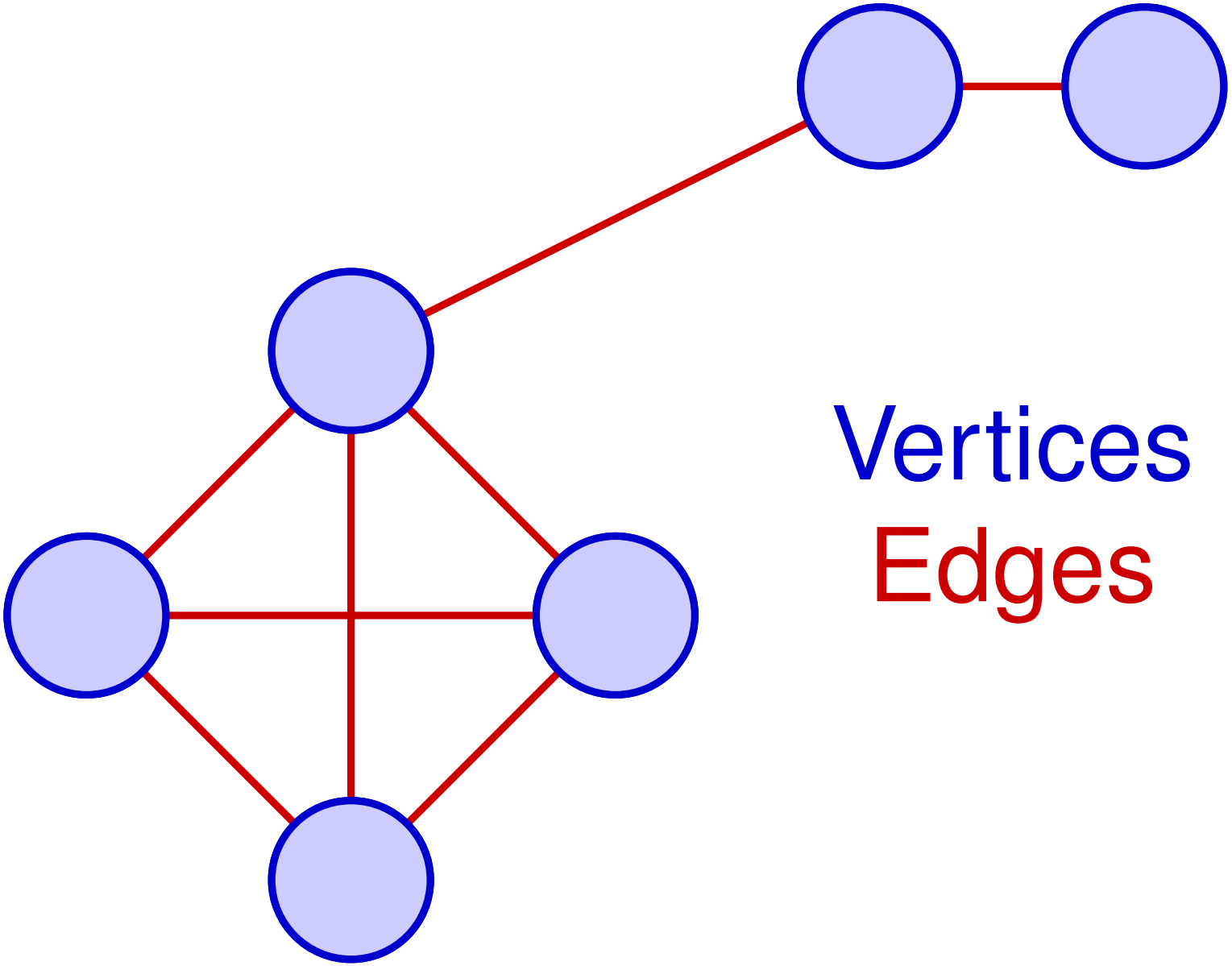
Geraint Palmer



Graphs



Graphs



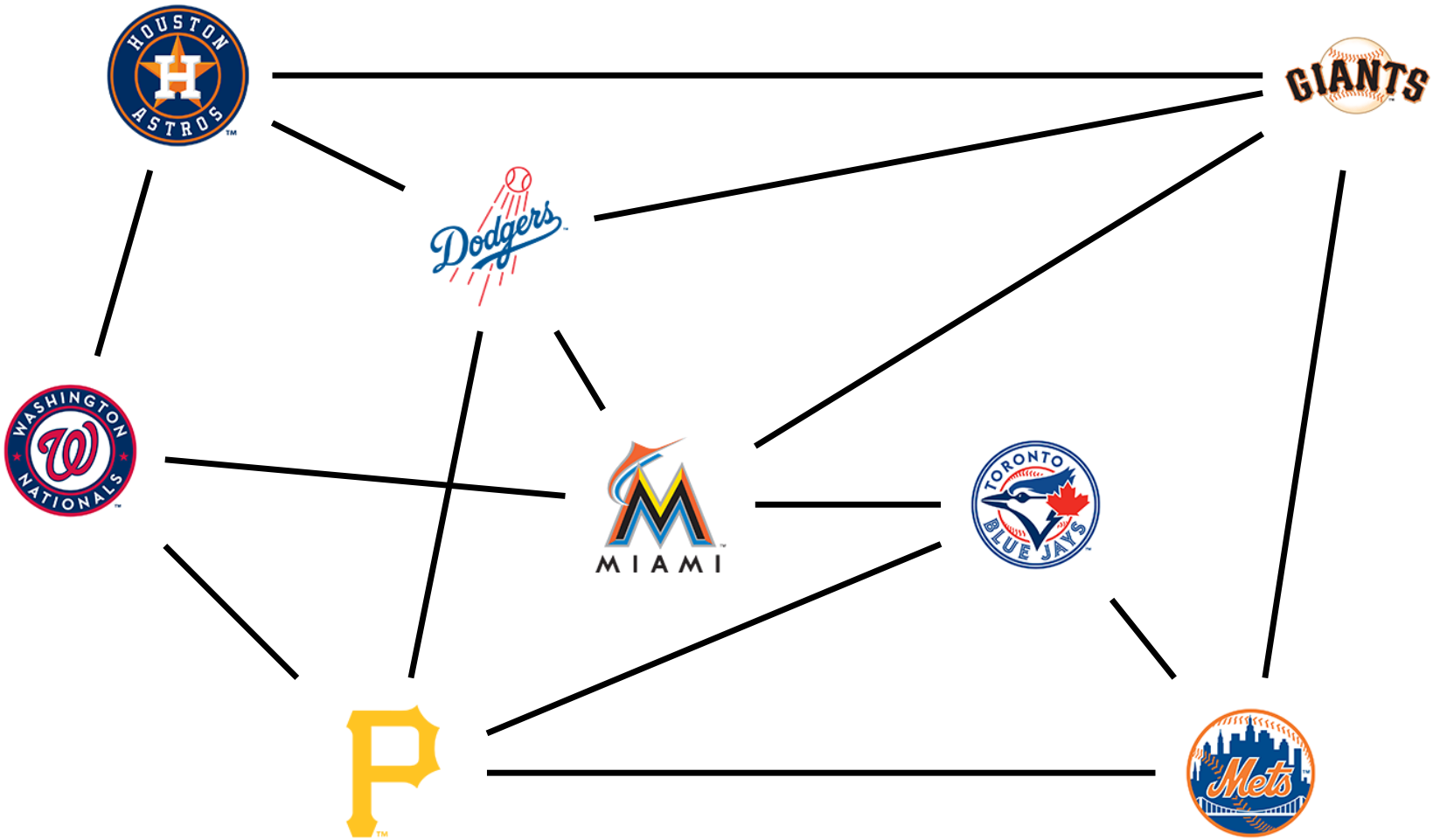
Vertices

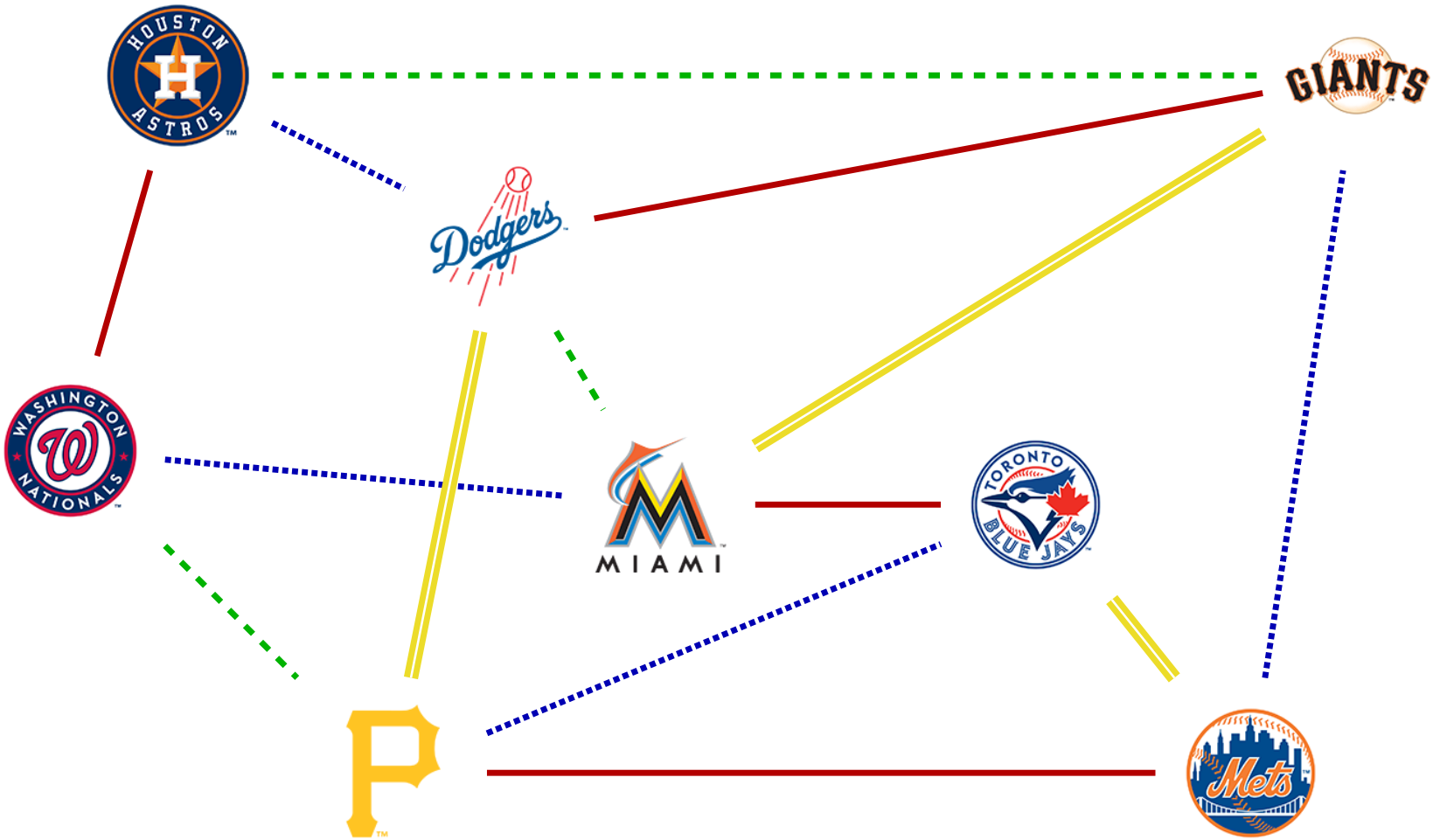
Edges

Edge Colouring - Scheduling Baseball

Dodgers vs Giants	Dodgers vs Miami	Dodgers vs Pirates	Dodgers vs Houston Astros	Giants vs Mets	Giants vs Houston Astros	Mets vs Toronto Blue Jays

Mets vs Pirates	Miami vs Toronto Blue Jays	Miami vs Washington Nationals	Toronto Blue Jays vs Pirates	Pirates vs Washington Nationals	Washington Nationals vs Houston Astros	Giants vs Miami


HOUSTON ASTROS
GIANTS
Dodgers
WASHINGTON NATIONALS
MIAMI
TORONTO BLUE JAYS
Mets

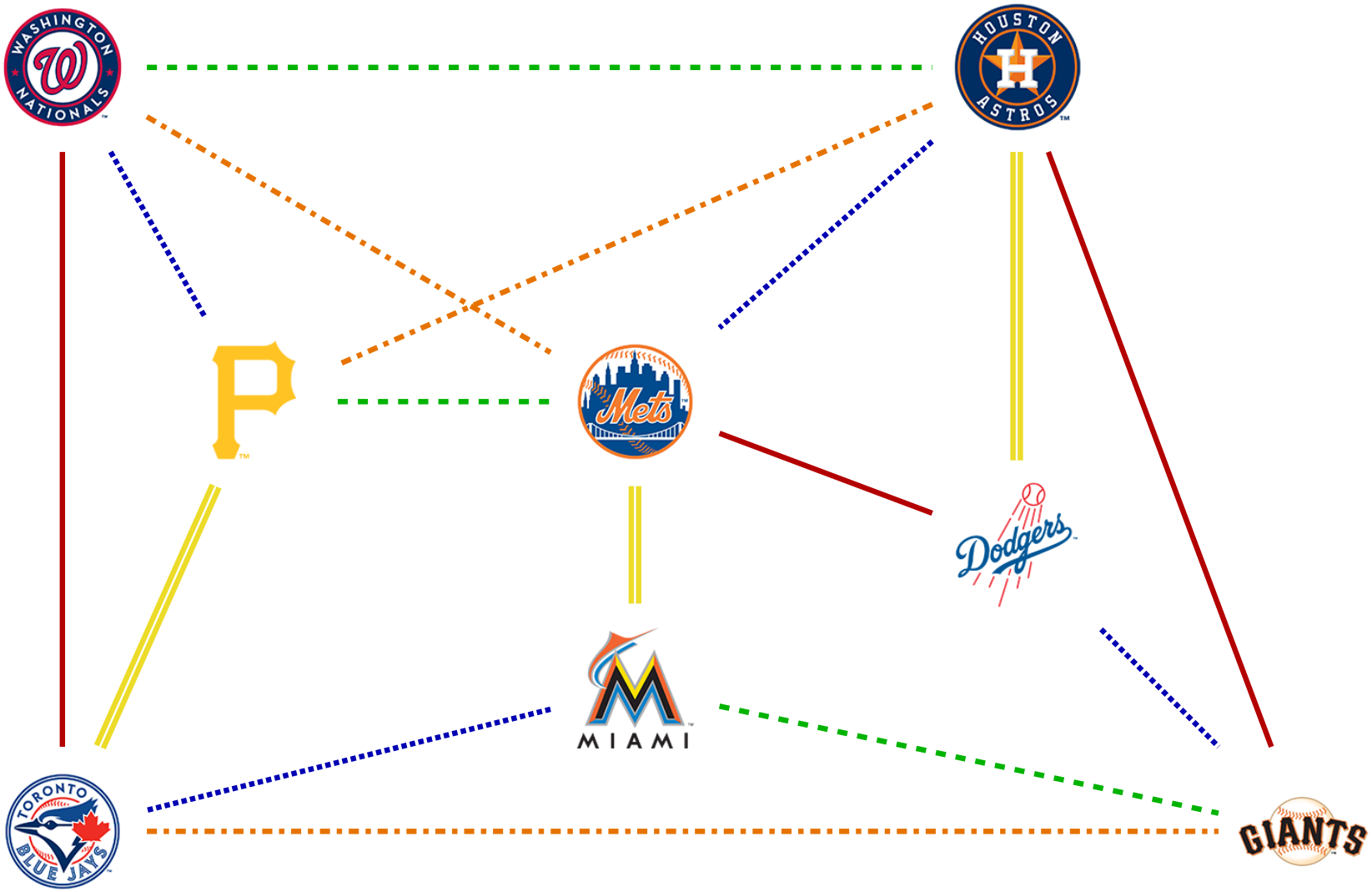

HOUSTON ASTROS
GIANTS
Dodgers
WASHINGTON NATIONALS
MIAMI
TORONTO BLUE JAYS
Mets

Task!

Using graph colouring, find a schedule for the following games:

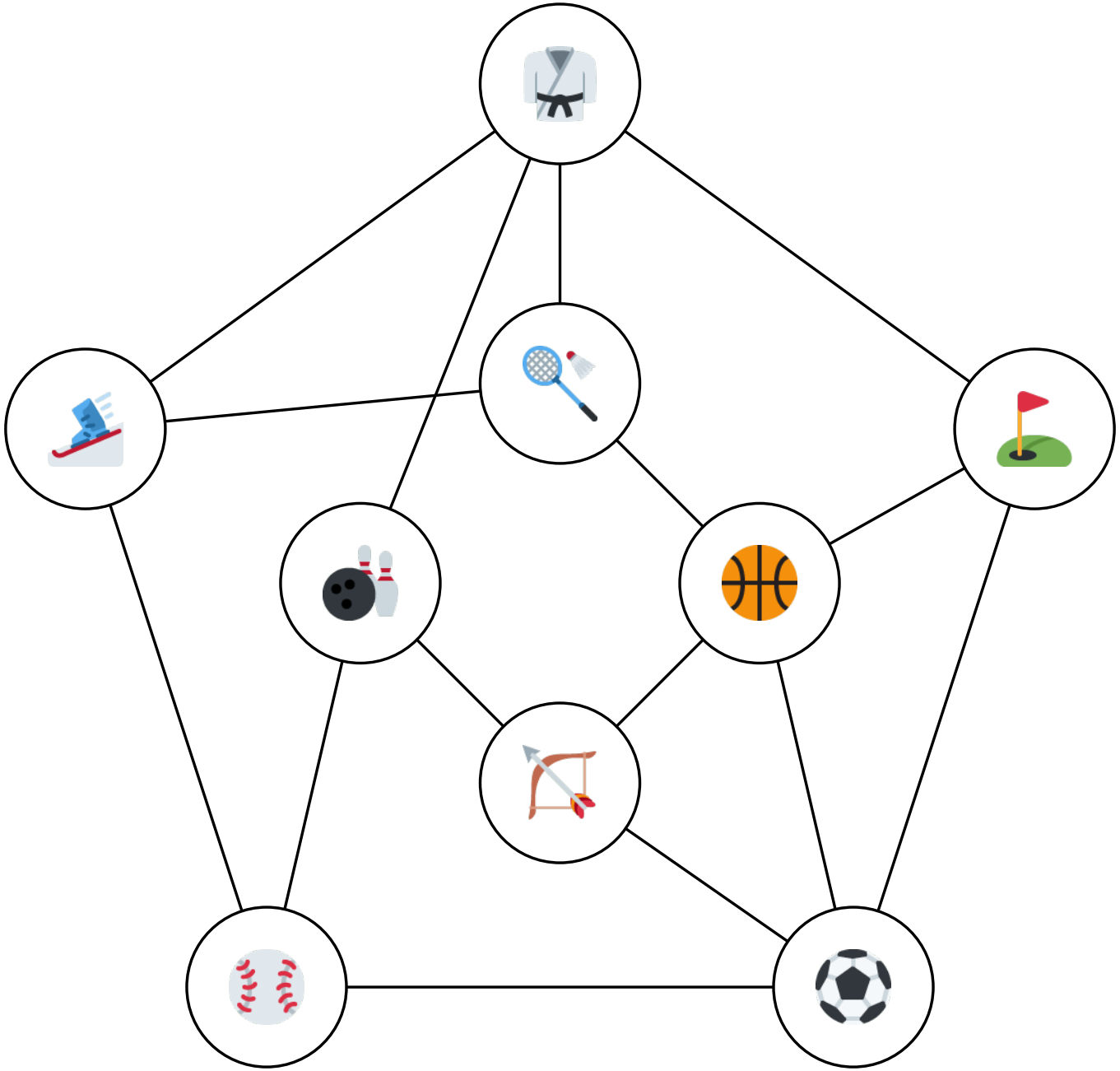
Washington Nationals vs Houston Astros	Mets vs Dodgers	Houston Astros vs Giants	Toronto Blue Jays vs Miami	Houston Astros vs Dodgers	Washington Nationals vs Toronto Blue Jays	Giants vs Dodgers	Pittsburgh vs Toronto Blue Jays

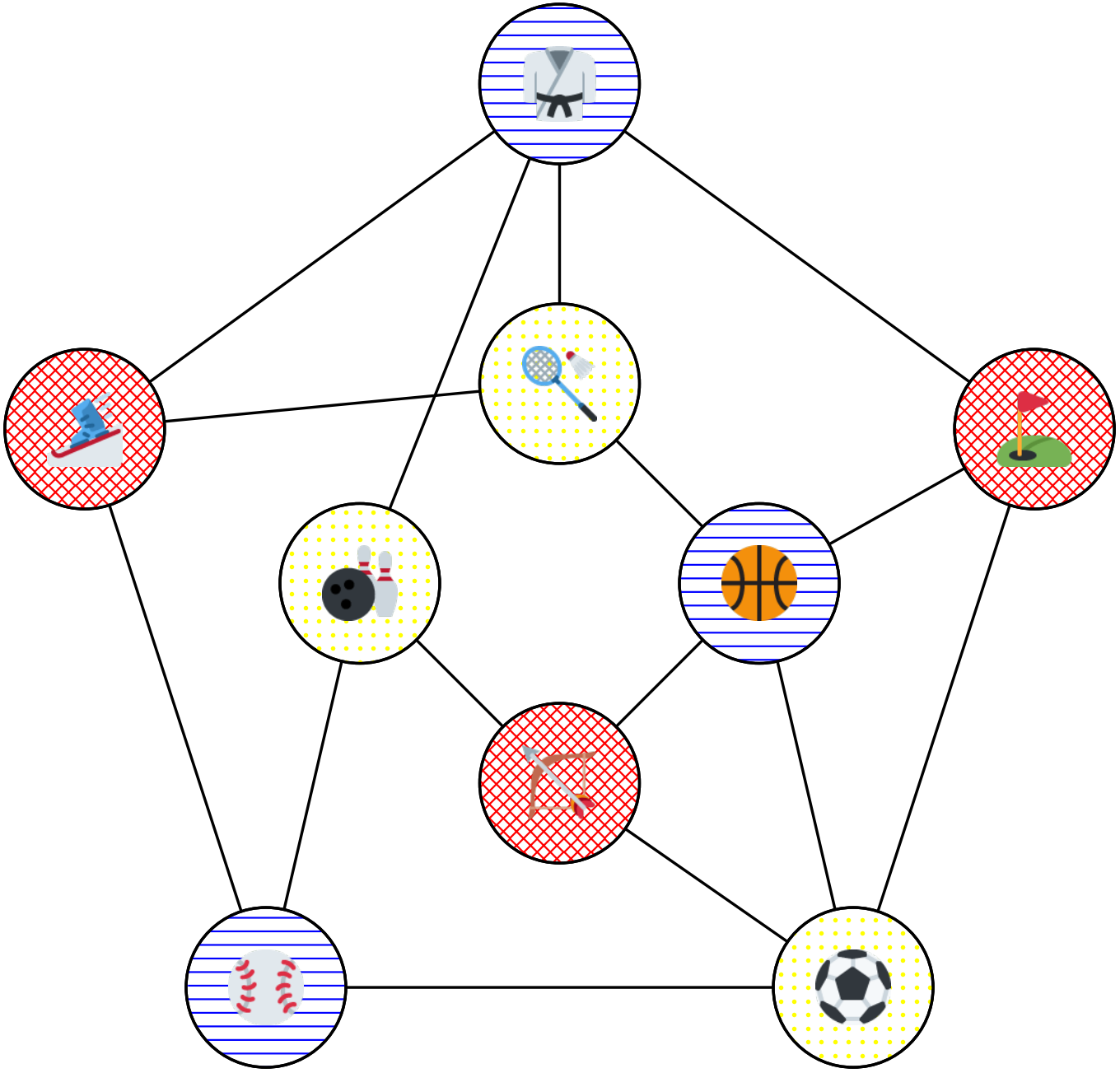
Washington Nationals vs Pittsburgh	Pittsburgh vs Houston Astros	Pittsburgh vs Mets	Toronto Blue Jays vs Giants	Mets vs Miami	Giants vs Miami	Washington Nationals vs Mets	Houston Astros vs Mets


WASHINGTON NATIONALS
HOUSTON ASTROS
Mets
Dodgers
MIAMI
TORONTO BLUE JAYS
GIANTS

Vertex Colouring - Event Scheduling

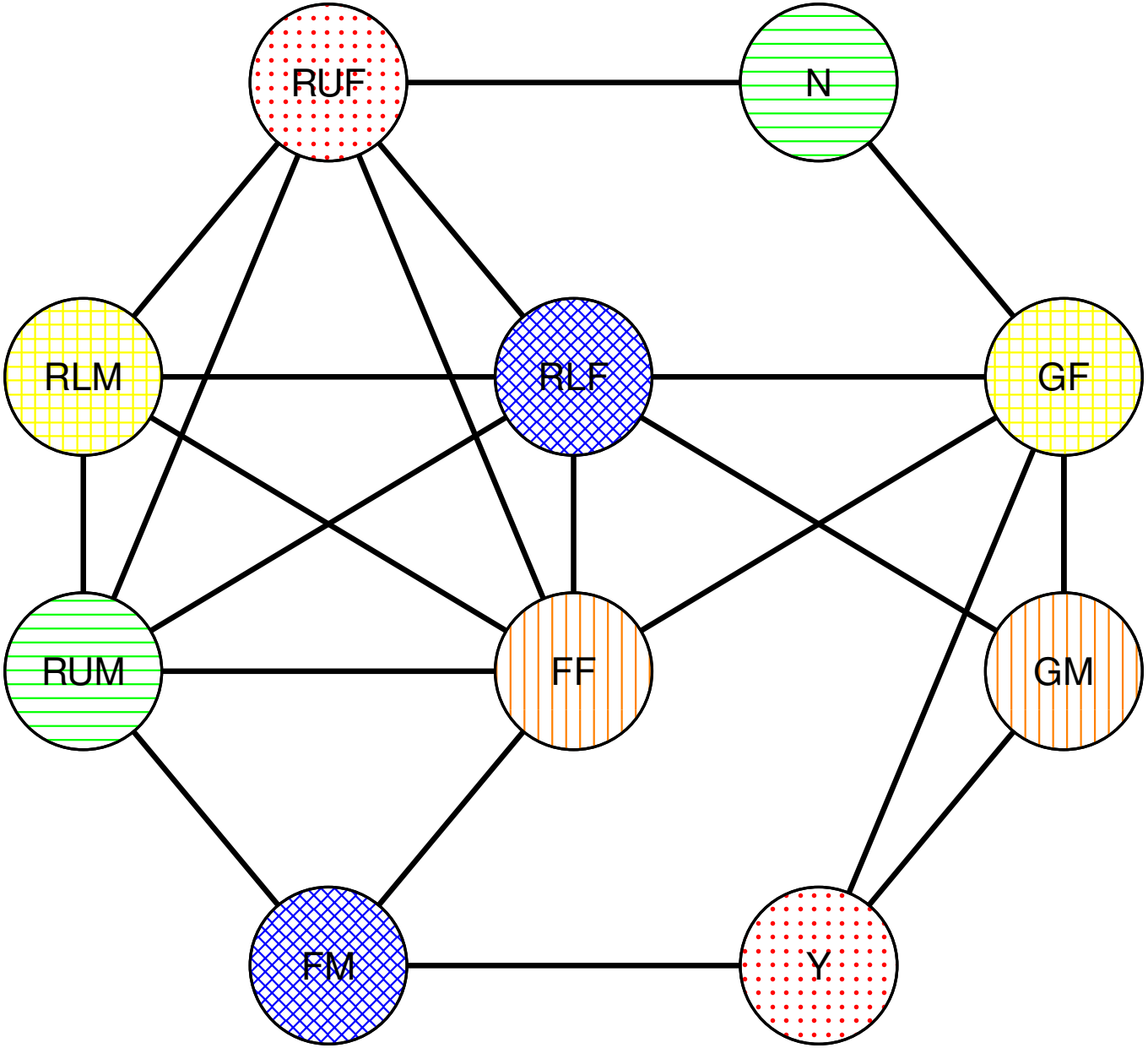
	⚽	🏸	🥋	🎳	🏂	⚾	⛳	🏀	🏹
⚽						X	X	X	X
🏸			X		X			X	
🥋		X		X	X		X		
🎳			X			X		X	X
🏂		X	X			X			
⚾	X			X	X				
⛳	X		X					X	
🏀	X	X		X			X		X
🏹	X			X				X	





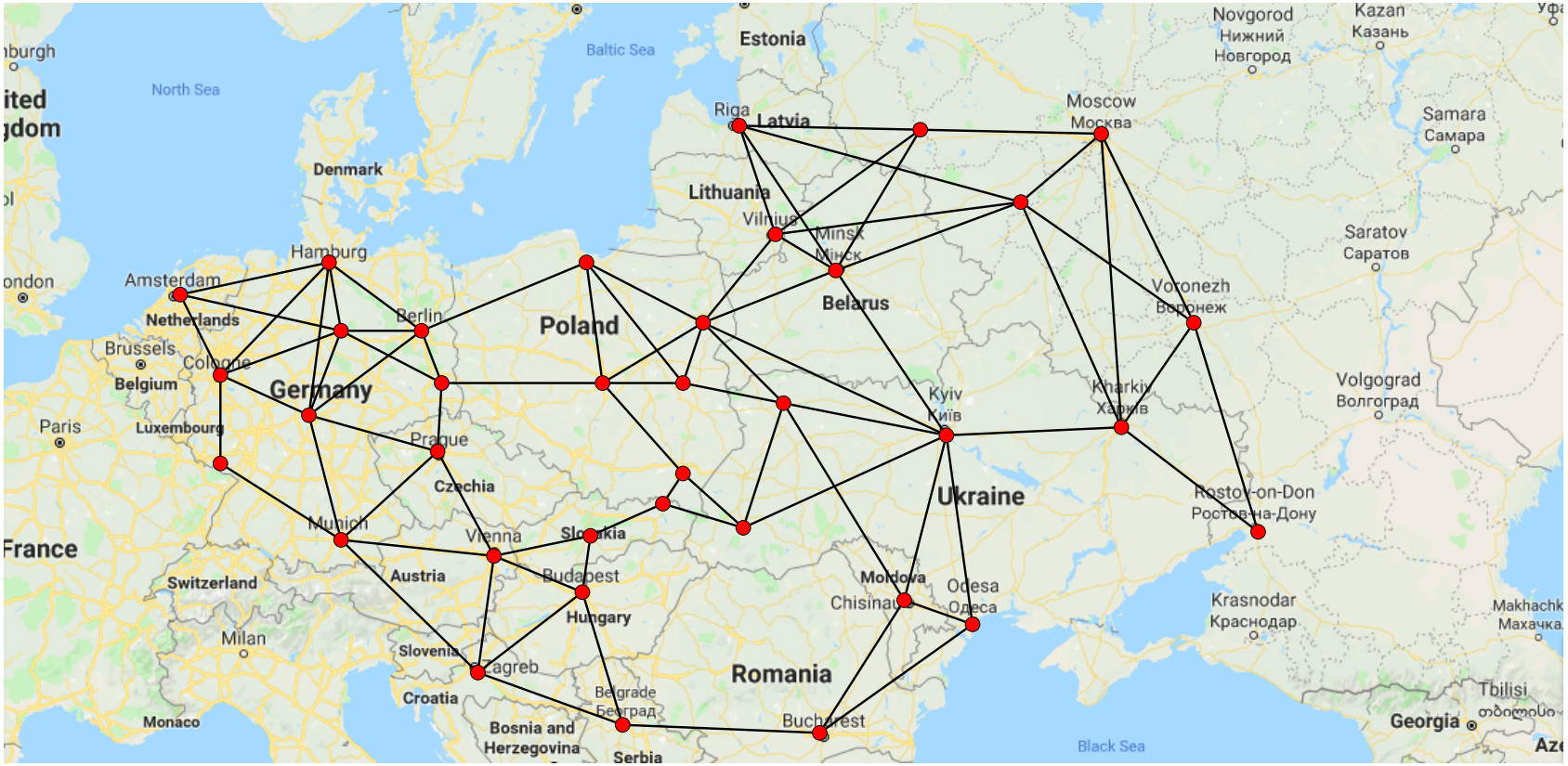
Task!

Using graph colouring, find a schedule for the school sports teams.

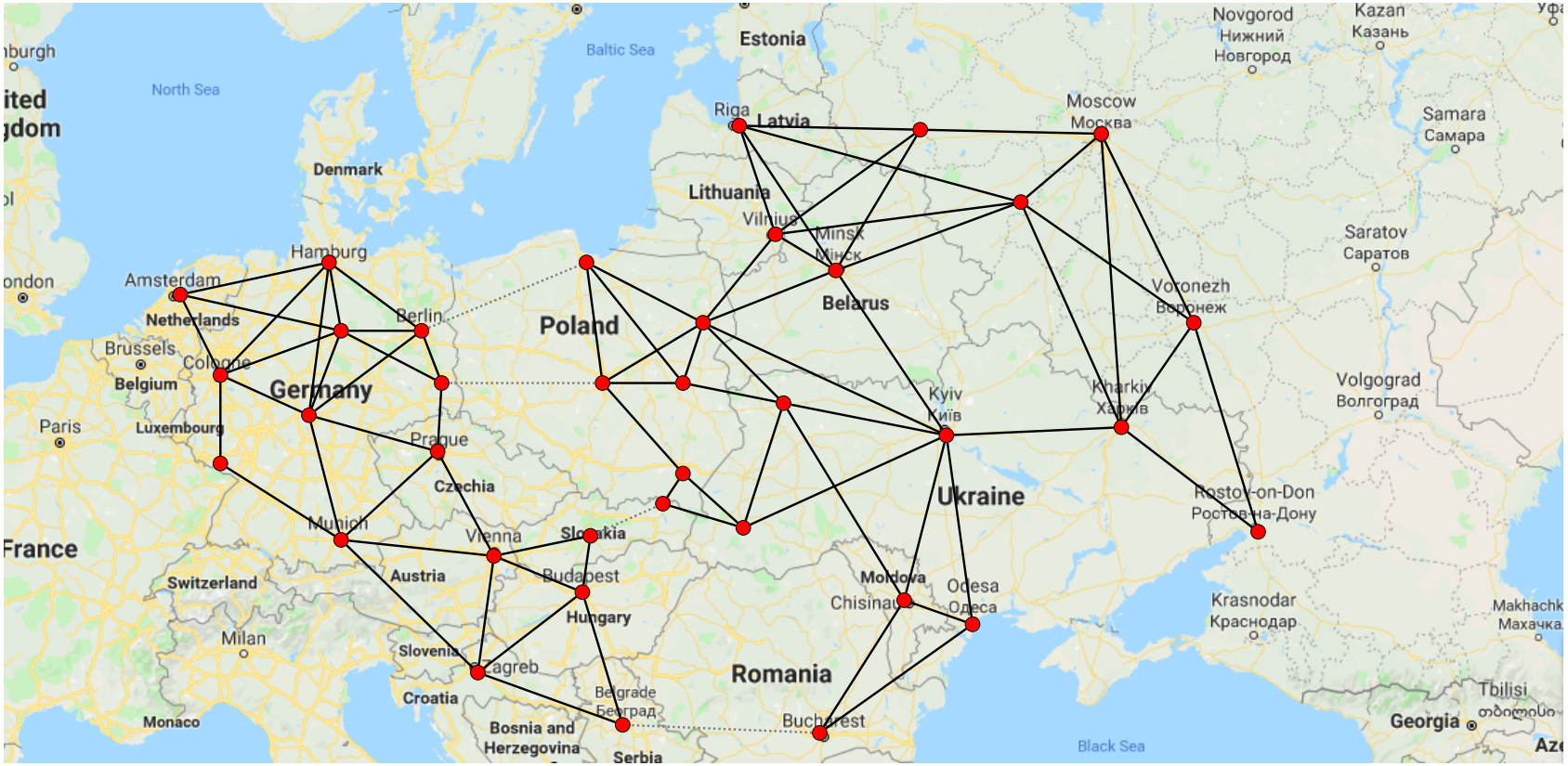

RUF
N
RLM
RLF
GF
RUM
FF
GM
FM
Y

Other uses of graph theory...

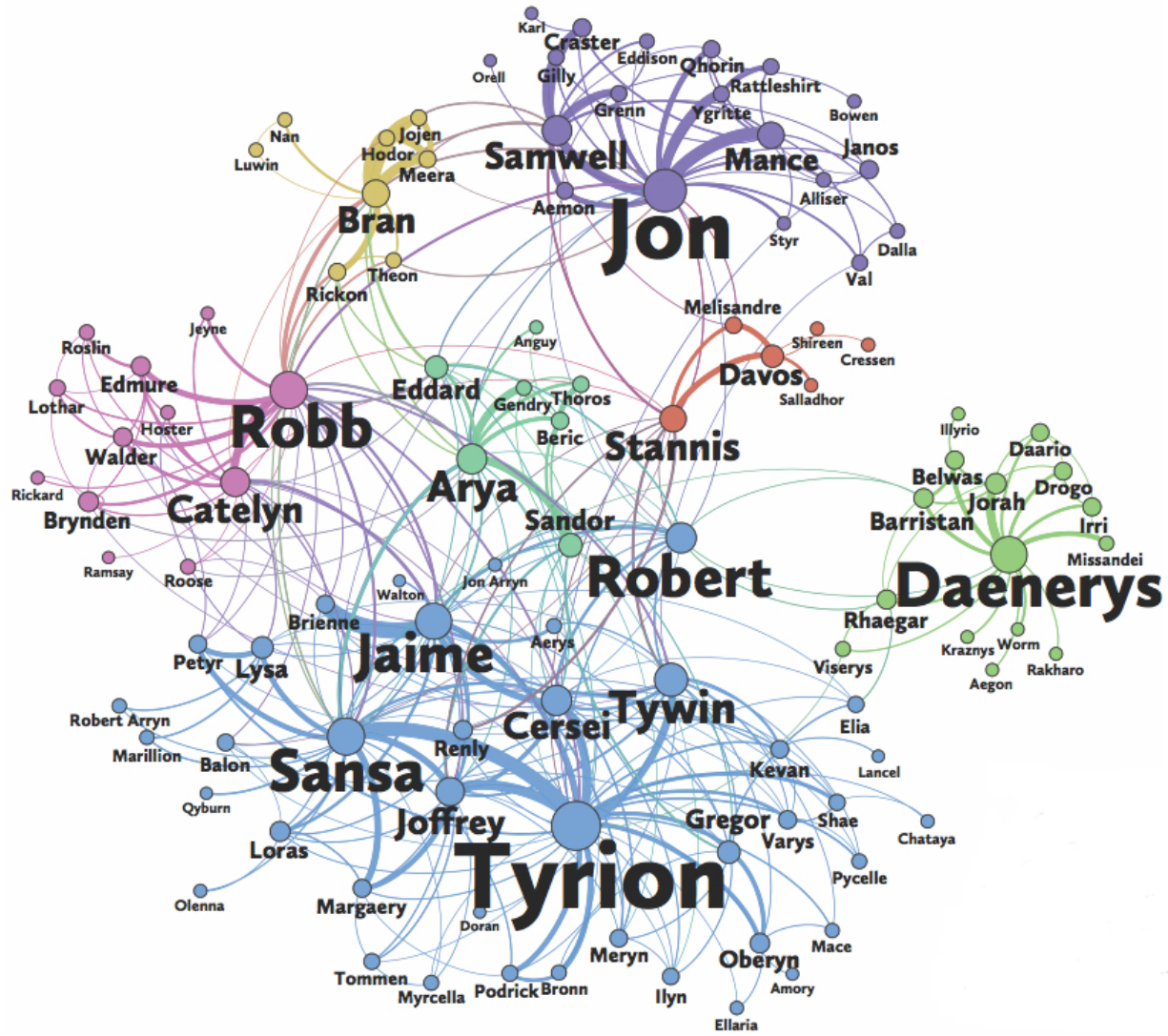
Minimum Cut Problems - Efficient Warfare

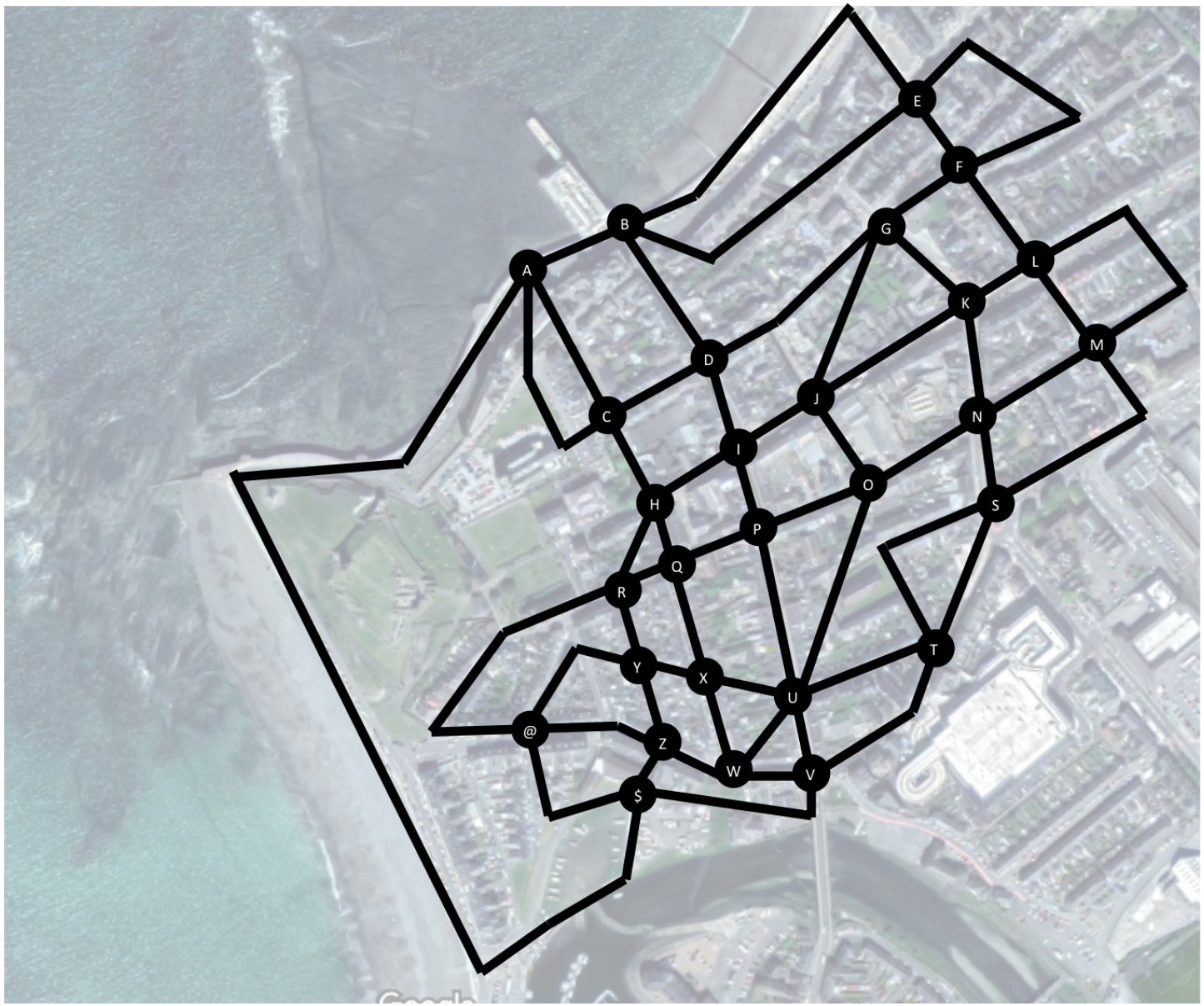


Minimum Cut Problems - Efficient Warfare



Social Networks



Beveridge A, and Shan J. “Network of thrones.” Math Horizons 23.4 (2016): 18-22.

Road Networks